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Current Economic Analysis I-**37**

Fish Meal and Oil Market Review

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U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

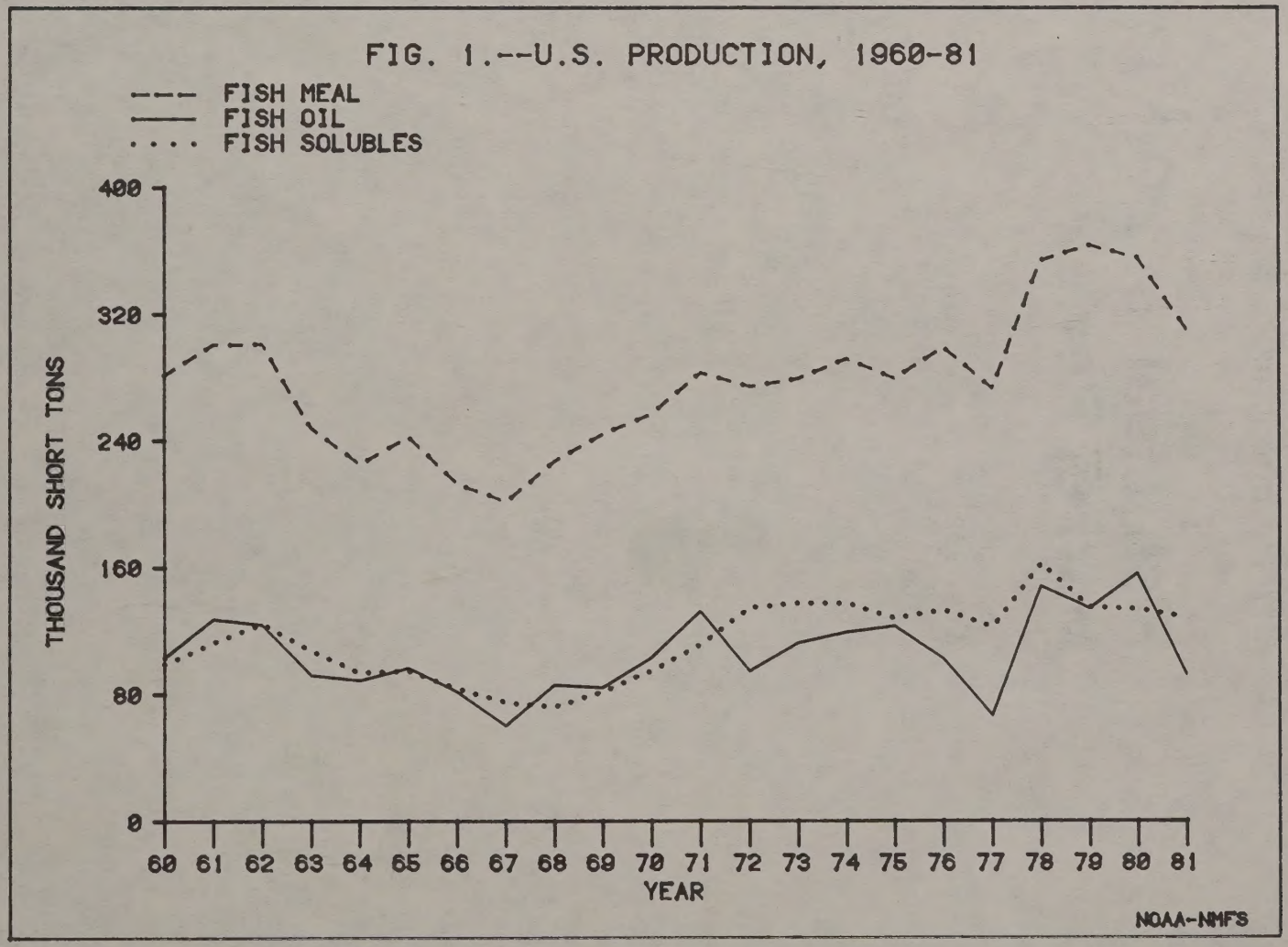
FIG. 1.--U.S. PRODUCTION, 1960-81
FISH MEAL
FISH OIL
FISH SOLUBLES
THOUSAND SHORT TONS
400
320
240
160
80
0
60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81
YEAR
NOAA-NMFS

FISH MEAL AND OIL MARKET REVIEW

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SUMMARY

Prices of fish meal and oil touched their lowest levels since 1976 in 1981 or early 1982, because of demand weakness which more than compensated for the declines in world production in 1981. The low price for fish oil occurred in September 1981 amidst brisk selling efforts. The reduction in world stocks of fish oil contributed to modest price strength since then, as did what appears to be a pattern of greater strength in prices of major oils than of major meals in early 1982. Prices of fish meal may have hit their post-1976 low in April 1982. According to estimates, the decline in world production of fish meal in 1981 was not as great as the declines in exports and consumption, and stocks increased in major exporting countries. Price reductions through early 1982 appear to have made fish meal quite attractive in comparison with other high-protein meals, and fish meal sales increased, though demand seems sluggish for all high-protein meals. Prices of fish meal and oil during the remainder of 1982 will depend heavily on agricultural and weather conditions that will affect Northern Hemisphere harvests of major oilseeds. Demand conditions in major consuming countries as a whole seem to be on the road to recovery, but are not strong.

U.S. production of fish meal, solubles and oil declined in 1981, the steeper decline in oil being attributed to the sharply lower yield of menhaden oil (fig. 1). Production of all fish and shellfish meals and solubles fell 11 percent to 382,742 short tons on a meal-equivalent basis. Production of fish oil fell to 184 million pounds, 41 percent below the record output of 1980. U.S. exports of fish oil in 1981 were based significantly on carry-over stocks, and consequently fell only 16 percent to 238 million pounds, exceeding production for the fifth time in 30 years. Imports of fish meal were 59,000 short tons and exceeded exports of 47,000 short tons for the year, though the country was a net exporter in the first 9 months of 1981. The outlook is for increased production in 1982, especially for fish oil, assuming a return to more normal yields of menhaden oil.

World production of fish meal fell slightly to about 4.5-4.7 million metric tons in 1981, while world consumption and exports fell more steeply, causing stocks to accummulate in major producing-exporting countries. By contrast, the 1981 decline in world production of fish oil to 1.1-1.2 million metric tons exceeded that for consumption and stocks declined. The outlook is for reduced world production of fish meal and oil in 1982, with beginning stocks of meal but not of oil causing downward pressure on prices.

FISH MEAL

U.S. and world production and exports of fish meal declined in 1981. Prices, which are determined largely in world markets for various high-protein feed ingredients, fell during 1981 and early 1982. Under the pressure of weakened economic conditions of most major consuming countries, the decline in world consumption exceeded the decline in world production in 1981 and stocks increased in the major producing-exporting countries, notably in two, Chile and Peru. The outlook is for lower world production in 1982 than in 1981 and lower prices have stimulated sales by the major exporters in early 1982, suggesting that their stocks will be drawn down and become less of a negative influence on prices than in 1981. Nevertheless, market conditions do not suggest much in the way of price strength or recovery.

U.S. Production Down

Total U.S. production of fish meal in 1981 amounted to 310,137 short tons, 13 percent below the level of 1980, but only 1 percent below the 1975-79 average (table 1). In addition to this amount, production of shellfish meal totalled 8,294 short tons, 26 percent more than a year earlier. Production of fish solubles declined 4 percent to 64,300 short tons (meal-equivalent basis, table 2).

Table 1.--Supply and use of fish meal (excluding shellfish meal), 1975-79 average, 1980 and 1981

Component	1975-79 average	1980	1981
	Thousand short tons		
Production			
Menhaden (1)	230.9	271.2	230.8
Anchovy	16.1	7.8	10.2
Tuna-mackerel	42.9	47.0	47.2
Unclassified	23.7	29.3	21.9
Total	313.6	355.3	310.1
Imports	94.8	49.5	59.4
New supplies	408.4	404.9	369.7
Exports	29.5	85.3	47.0
Net supplies	378.9	319.6	322.5

(1) May include small quantities made from other species.

Table 2.--U.S. production of fish solubles, 1975-79 average, 1980 and 1981

Component	1975-79 average	1980	1981
	Thousand short tons		
Production			
Menhaden (1)	100.7	99.4	99.7
Unclassified	35.5	34.3	28.9
Total	136.2	133.7	128.6

(1) May include small quantities made from other species.

The overall shortfall in production was principally attributed to lower output of menhaden meal in 1981. In the Gulf of Mexico, total menhaden landings for reduction were 609,000 short tons, 21 percent below the 1980 total. Fishing effort in the Gulf (measured in vessel ton-weeks) was about 2 percent less, and landings were markedly low in June and August. On the Atlantic coast, landings of menhaden were reasonably good, albeit 5 percent below the 1980 level, and fishing effort was slightly lower in 1981. Catch in the Atlantic was good early in the season, and then fell somewhat in August-September. The North Carolina fall fishery reported the largest catch since 1966. Accordingly, production of menhaden meal totalled 230,824 short tons, 15 percent less than in 1980 and about equal to the 1975-79 average.

The decline in menhaden meal production was not significantly offset by trends in the other fish meals. Output of tuna-mackerel meal was 47,179 short tons in 1981, virtually unchanged from 1980. Meal production was maintained, although receipts of tuna at canneries were 1 percent below a year earlier and California cannery receipts of purse-seine mackerel were 5 percent lower. Anchovy meal production in 1981 was more than 10,000 short tons, 31 percent above a year earlier. Sharply higher anchovy landings in the August 1980-June 1981 season caused this marked improvement, especially in the first half of 1981. However, in the current season, which began in August 1981, anchovy landings have fallen back to much lower levels. For unclassified fish meal, production in 1981 dropped 25 percent from the 1980 level.

U.S. Trade

The United States once again became a net importer of fish meal in 1981, principally on the strength of shipments from Chile in the last quarter. U.S. imports totalled 59,000 short tons in 1981, 20 percent greater than in 1980, but 37 percent below the 1975-79 average. Chile was the leading supplier with 26,763 short tons, 22,354 tons of which arrived in the fourth quarter. Chile has not been a consistent U.S. supplier in recent years, and shipments in 1980 were nil. As a result of Chile's increase in 1981, imports from Canada, which were unchanged from 1980, took second place (at 24,266 short tons). Panama, the only other large supplier, dropped 54 percent from its 1980 level (to 8,345 short tons).

U.S. exports of fish meal in 1981 totalled 47,027 short tons, a decline of 45 percent from the 1980 record, but 59 percent above the 1975-79 average. Egypt, the largest buyer, increased its purchases in 1981 to 18,659 short tons, 89 percent above 1980. The second leading buyer, West Germany, was close behind with 18,466 short tons, 62 percent below the previous year.

Export activity was concentrated in the first three quarters of the year, and dropped off significantly in the last three months. In fact, the United States was a net exporter of fish meal for the period January-September 1981. Then, in the last quarter imports increased, more than making up the difference. The reason for the change can be traced to the relative prices for fish meal in the United States and abroad. The price of fish meal at Hamburg can be used as a good indicator of the world price, and especially for the Western European countries, which are large consumers of fish meal. Until September 1981, the Hamburg price was higher than the U.S. price of menhaden meal, thus encouraging higher U.S. exports (figs. 2 and 3). Since October, the situation has been reversed, with the U.S. price above the European price; in this period exports have fallen off, and imports have prevailed.

For the first quarter of 1982, this situation continued, with the U.S. menhaden meal price above the Hamburg fish meal price. Accordingly, U.S. imports (4,563 short tons) exceeded exports (1,926 short tons). U.S. trade was relatively slow during this period; both imports and exports were well below the respective 1976-80 averages. This overall situation is a reflection of the general sluggishness in demand.

World Situation

World demand for fish meal weakened more than supply in 1981; exports fell by a larger percentage than production; and stocks of fish meal rose because of the imbalance in production and consumption. World production of fish meal declined slightly in 1981 and was about 1-2 percent below the 1976-80 average at 4.5-4.7 million tons (range of estimates, each show small declines). Among major producers, only Japan and Chile experienced increases.

Table 3.--Supply and use of fish meal for selected major exporting countries, 1975-79 average, 1980 and 1981

Component	1975-79 average	1980	1981
	Thousand metric tons		
Supply			
Beginning stocks	334	323	228
Production	1,616	1,540	1,583
Total supply	1,950	1,863	1,811
Use			
Exports	1,336	1,358	1,137
Domestic use	303	278	244
Total use	1,639	1,637	1,381
Ending stocks	311	228	444

Note: Includes Chile, Iceland, Norway, Peru, and South Africa. Excludes Peruvian cannery meal.

World exports dropped in 1981, but at a steeper rate than production. Some estimates put the total at about 2.0 million metric tons, a decline of about 14-16 percent from the 1980 level. Most notable were the declines for the major producers in South America. Despite increased production, Chile's exports fell 13 percent to 439,000 metric tons in 1981. Even so, Chile remained the leading exporter of fish meal in the world. Exports from Peru, the second most important seller, fell 28 percent in 1981. Among the leaders in Northern Europe, exports declined also, although the declines were more commensurate with decreases in production.

The drop in world exports in 1981 reflects the weakness in demand for fish meal seen throughout the world. Despite price declines during the year, prices were still perceived as high relative to competing products for much of that period. Imports and apparent consumption in the EEC countries (European Economic Community), heavy users of fish meal, accordingly dropped more than 20 percent. Usage also fell significantly in Eastern Europe, whose

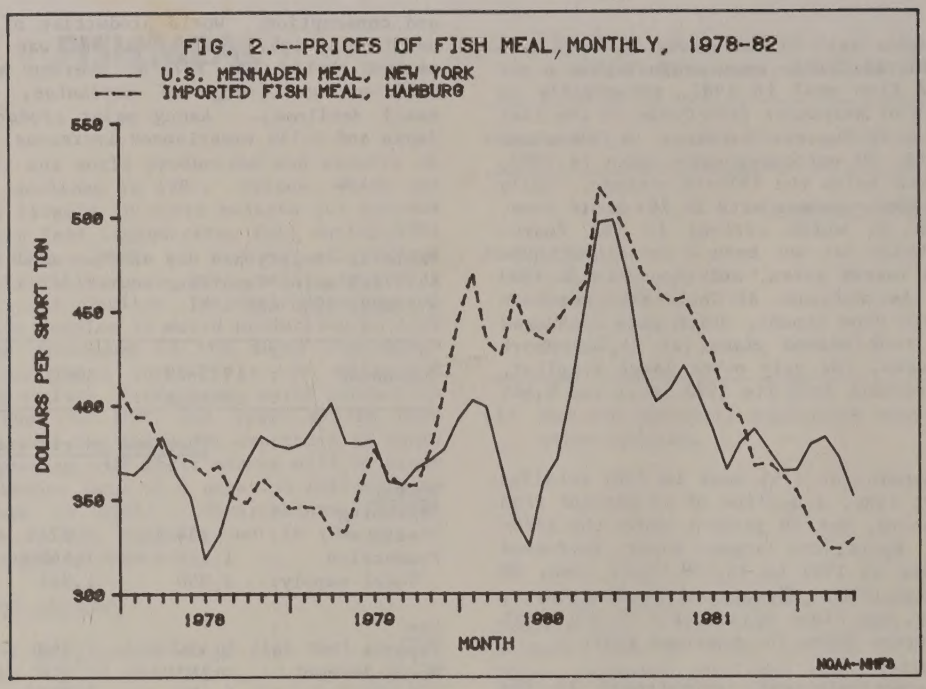


FIG. 2.--PRICES OF FISH MEAL, MONTHLY, 1978-82
U.S. MENHADEN MEAL, NEW YORK
IMPORTED FISH MEAL, HAMBURG
DOLLARS PER SHORT TON
550
500
450
400
350
300
1978
1979
1980
1981
MONTH
NOAA-NMFS

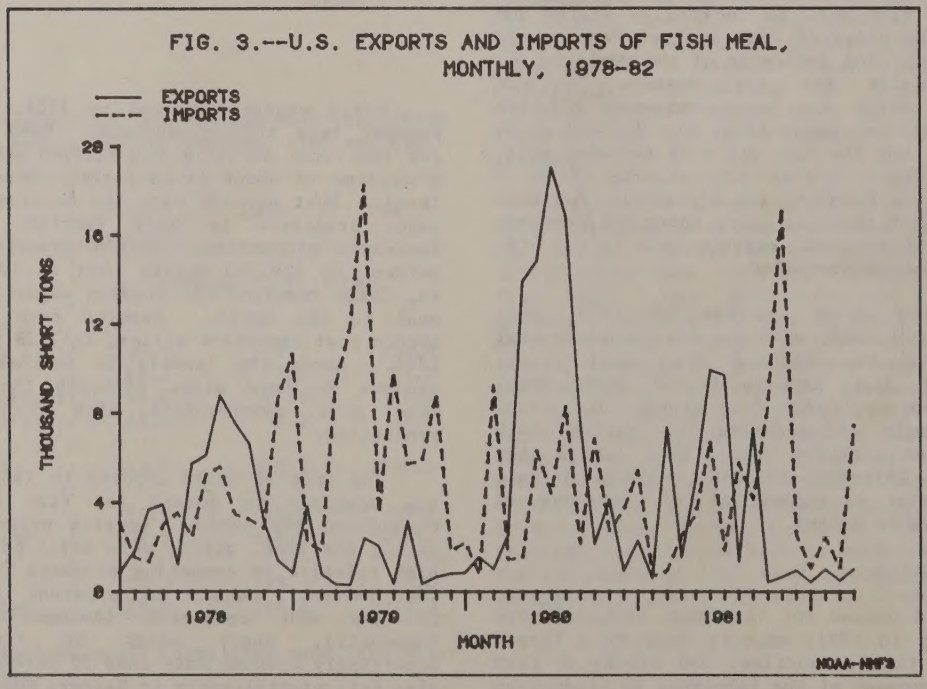


FIG. 3.--U.S. EXPORTS AND IMPORTS OF FISH MEAL, MONTHLY, 1978-82
EXPORTS
IMPORTS
THOUSAND SHORT TONS
20
16
12
8
4
0
1978
1979
1980
1981
MONTH
NOAA-NMFS

imports were hampered by problems with balance of payments. Japan, the leading consumer, saw its domestic consumption drop about 15 percent. A 70-percent increase in exports and a decline in imports reduced Japanese net imports to a very low level. In contrast to these trends of decline, usage of fish meal has been increasing in Iran and South Africa. In fact, South Africa became a net importer in 1981, despite its traditional role as an exporter. Available data suggest that U.S. domestic use of fish meal increased slightly in 1981, though not as much as broiler chick placements, an indicator of demand (table A-1).

High prices at the beginning of 1981 discouraged sales. Inventories grew as a result: by the end of September 1981, stocks of major producers were over 1.0 million metric tons, about 30 percent greater than the 1976-80 average. Stock levels were especially high in Chile and Peru. As of September 30, 1981, Chile held 297,000 metric tons of fish meal, 60 percent above a year earlier; Peru held 160,000 metric tons, five times the level of September 30, 1980. In addition to the weakened demand for all meals and the more attractive prices of competing meals, the relatively stronger position of the U.S. dollar in 1981 hurt sales of countries such as Peru and Chile whose prices are quoted in U.S. currency. Inventories carried into the new year were still critically high. In Peru, the total was 130,000 metric tons, and in Chile 207,000 metric tons. The abundant supply of fish meal kept pressure on prices, which continued their retreat. By April 1982, the price at Hamburg had fallen to $323 a short ton--the lowest level since 1976. At such price levels, fish meal, usually considered a premium product, was very close to soybean meal on a per-unit-protein basis. Despite the dropping prices, demand has been slow in reviving.

Prices

The weakness in demand for fish meal was reflected in prices, which generally trended lower in 1981, as did prices throughout the larger market for high-protein feed ingredients (fig. 4). Prices of soybean meal (50 percent protein), for example, had reached a peak of $277 in November 1980, but then fell, drifting lower throughout most of the following year. By November 1981, the price had reached a low of $193; it has moved a bit higher since then. The price of menhaden meal at New York, which started at a high of $498 per short ton in December 1980, fell during most of 1981. Short supplies gave some temporary support to the price in late March-May, before the effects of the new season's menhaden catch were felt. Again in September-October, tightening supplies lent firmness to the menhaden meal price. However, the prevailing weakness brought the price down to $365 by December 1981, 27 percent below the year-earlier level. Since then, the price rose moderately to $383 in March 1982 on the strength of low U.S. inventories, but has since dropped even further to $351 in May. Prices for tuna-mackerel meal showed the same downward trend, although they experienced less movement from week to week. The price at Los Angeles started at a high of $385 in November 1980-January 1981, and fell 18 percent through the year, settling at $316 in October 1981-February 1982. The European price of fish meal experienced a more steady path of decline in 1981 relative to U.S. prices. In addition to weak demand, large stocks of fish meal in major exporting countries helped depress the prices even further.

OUTLOOK

U.S. production in 1982 is likely to be ahead of the 1981 total. In the first three months of 1982, total fish meal production has amounted to 12,784 short tons, 31 percent behind the previous year. This figure does not reflect developments in production of menhaden meal, however, whose season does not begin until April. At Beaufort, North Carolina, NMFS biologists have estimated that menhaden catch may advance about 6 percent over the previous year. In the Gulf, fishing effort in the menhaden purse-seine fleet is expected to increase. Age composition of the 1981 catch also points to higher catch in the 1982 season, so that Gulf landings may show an improvement of about 18 percent. In the Atlantic, however, despite promising biological factors, fishing effort will likely be less than in 1981. The Atlantic menhaden catch in 1982 may decline by about 11 percent.

U.S. trade patterns in 1982 will depend on a variety of factors. With the currently low prices of fish meal worldwide, the United States may not be a significant exporter in the near future. In the period January-April 1982, U.S. exports of fish meal totalled 2,958 short tons, 75 percent lower than the similar four-month period of 1981. U.S. imports increased 26 percent to 12,031 short tons in the same period of 1982, due principally to a large shipment from Chile in April. As long as U.S. prices of fish meal remain higher than prices elsewhere, imports tend to exceed exports.

Soybean meal prices are expected to be low in 1982, with good supplies and sluggish demand conditions in general. No real improvement is expected until the second half of the year. Similarly, broiler production may not show much improvement until after the second quarter of 1982; some estimates project an increase of 1 percent in the last half of the year from a year earlier. Trends in fish meal prices will be strongly influenced by such factors in the larger high-protein feed ingredient market.

And, as the 1982 menhaden season gets underway, domestic supplies should be adequate. Thus, prices may not receive strong support in the near future.

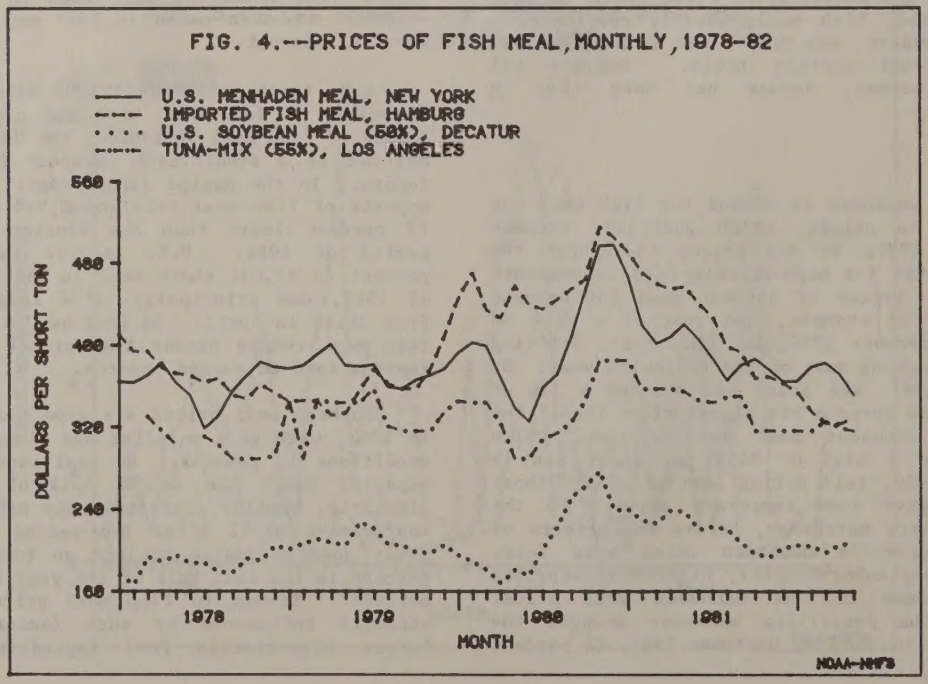
In the world situation for fish meal in 1982, production is expected to decline slightly further from 1981 levels. For January-March 1982, five major exporting countries reported a 1-percent increase in combined production from a similar period in 1981, an increase for Chile offsetting declines for the other four countries. In Northern Europe in particular, production may be significantly lower because of the low stocks of capelin. In January-March, Iceland's fish meal production dropped 53 percent from a year earlier; production in Norway fell 19 percent.

Reportedly, the Peruvian Government temporarily allowed processors to ignore restrictions on the amount of fish meal produced in January-March 1982. The purpose of this move was to allow processors to use pilchard for reduction (into fish meal and oil), because of the high stocks of canned pilchard, which is also suffering from weak demand. Apparently, ocean conditions are improving, and catch is likely to increase in 1982; thus, meal production should rise. In Chile, a slight decline in output for 1982 is possible, although the resources should remain healthy. Until demand recovers and the high stocks of fish meal are reduced in these South American countries, production may not be as large as otherwise would be possible.

World prices of fish meal have probably hit their lowest levels. The price at Hamburg was $323 per short ton in April 1982, 37 percent below the previous high of $515 in November 1980. Although demand has not strengthened as soon as many had expected, the most recent reductions should be having their effect; fish meal has always shown itself to be a desirable product. In January-March 1982, shipments from leading exporting countries were already 45 percent above a year earlier. World exports for the year 1982 should show marked improvement, perhaps increasing by 10 percent or more. Consumption will likewise be higher, but expansion in use will be more limited (perhaps about 5 percent). In Western Europe (especially the United Kingdom and West Germany), consumption and imports should increase over 1981, but still may not equal the levels achieved in earlier years.

As the lower prices encourage more sales, stocks of fish meal should be drawn down to more reasonable levels. New supplies from production will be limited in 1982. As a result, prices may increase somewhat, although any strength will be tempered by demand factors, including the effects of supplies of competing products and sluggish economic conditions in most major consuming countries.

FIG. 4.--PRICES OF FISH MEAL, MONTHLY, 1978-82



FISH OIL

U.S. production and exports of fish oil declined in 1981, because of the sharply lower yield of menhaden oil and lower menhaden catch. Annual world production and exports fell in 1981, but the increased exports in the fourth quarter of 1981 depleted stocks and led to modest price strength in early 1982. World production and exports of fish oil are expected to fall again in 1982. This and the strengthening of prices of various oils in comparison with meals in early 1982 suggest some basis for possible further improvement in prices of fish oil which have been trending downward since 1977.

U.S. Production Down

U.S. output of fish oil in 1981 totalled 184.3 million pounds, a sharp drop of 41 percent from the record 1980 level, and 20 percent below the 1975-79 average (table 4). The principal reason for this shortfall was the poor oil yield from menhaden in the 1981 harvest. This development was of concern to producers, who depend on oil sales. Menhaden oil production was valued at $31 million in 1981, down 43 percent from 1980. It accounted for 23 percent of the total value of menhaden products in 1981 ($132 million) compared with 32 percent of the total value in 1980 ($166 million). It is not certain that the poor yield can be attributed to any specific factor, but may simply be an unpredictable phenomenon. Oil yield was similarly low in 1977. Menhaden oil production thus reached 170.0 million pounds in 1981, 42 percent behind 1980, and 19 percent below the 1975-79 average. Output of tuna-mackerel oil, at 4.5 million pounds, showed a 10-percent improvement over the 1980 level. However, production of other oils was also down significantly in 1981: anchovy oil fell 25 percent, and unclassified fish oil dropped 45 percent from a year earlier.

Sales Down

Because of the lower production in 1981, U.S. exports of fish oil dropped also, but not as dramatically. Shipments of menhaden oil fell to 234.6 million pounds, 13 percent below the high level of 1980, while the value dropped 19 percent to $40 million. The United Kingdom was the largest buyer, taking 96.8 million pounds, an increase of 16 percent over the previous year. The Netherlands fell to second place in 1981, reducing its purchases by 9 percent to 76.6 million pounds. Other secondary buyers in 1981 included Belgium/Luxembourg, Sweden, West Germany, and Peru. Of these countries, only Sweden bought more menhaden oil in 1981 than in 1980; all the others experienced a decline. Exports of other fish oils were also lower in 1981; the total of 3.7 million pounds fell 73 percent short of the previous year. The Netherlands and Venezuela were the largest buyers in this category. Overall, total U.S. exports of fish oil in 1981 totalled 238.3 million pounds, 16 percent below the record set in 1980, but 35 percent above the 1975-79 average.

U.S. domestic use of fish oil is relatively small compared to exports, and has been diminishing in recent years. In 1981 the total was 20.0 million pounds, 8 percent below the previous year. As a result, total use of U.S. fish oil amounted to 258.4 million pounds. The fact that this total was greater than new supplies (production plus imports) in 1981 indicates that stocks were reduced.

Table 4.--Supply and use of fish oil, 1975-79 average, 1980 and 1981

Component	1975-79 average	1980	1981
	Million pounds		
New supplies			
Production			
Menhaden (1)	210.2	291.4	170.0
Anchovy	5.6	2.3	1.7
Tuna-mackerel	5.3	4.1	4.5
Unclassified	8.4	14.7	8.1
Total	229.5	312.5	184.3
Imports	15.3	21.4	18.3
Total supply	244.8	333.9	202.6
Use			
Exports	176.4	284.0	238.3
Domestic use	35.4	21.9	19.6
Total use	211.8	305.9	257.9

(1) May include small quantities made from other species.

World Situation

World production of fish oil fell in 1981 by 11 percent from the previous year, according to some estimates, because of declines on the part of all major producers (Denmark, Iceland, Norway, United States, Chile, Peru, and Japan). World exports were similarly 10 percent below 1980 levels in the first nine months of 1981. However, there was downward pressure on the price in July-September 1981 because of the seasonal peak in world production and the effect of high interest rates on willingness of producers to hold inventories. Fish oil became an attractive buy compared with competing oils and fats, and world exports in October-December

1981 surpassed year-earlier levels by 24 percent. As a result, exports for the year 1981 were only 2 percent below the 1980 total, and world disappearance of fish oil declined only about 3 percent. By the end of the year, stock levels had declined considerably, and at the beginning of January 1982 were 19 percent below a year earlier. Because of low stocks and poor prospects for 1982 production, world supplies of fish oil are tight and are expected to remain so. Prices of fish oil in Hamburg since January have shown some strength accordingly, especially when compared with prices of competing products.

Prices

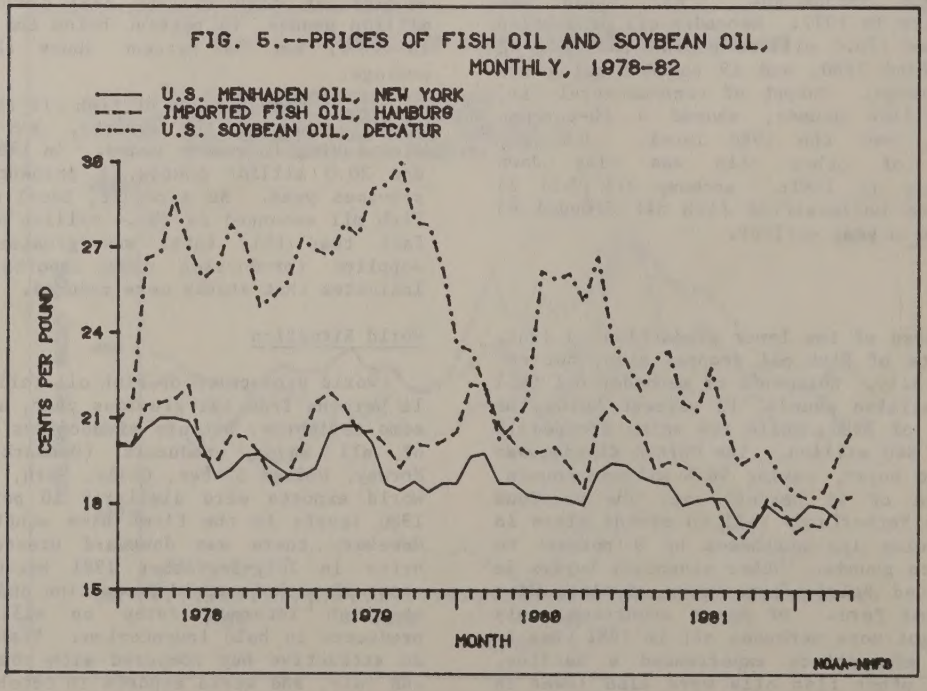
Prices of fish oil are determined largely by prices in the broader market for all fats and oils. The price of soybean oil, for example, trended lower in 1981, especially in the last half of the year (fig. 5). The price dropped from a high of 27 cents per pound in November 1980 to 23 cents by January 1981. After fluctuating in the 21-23 cent range until July, the price fell further, finally hitting a low of 18 cents per pound in February 1982. Prices for fish oil similarly drifted lower. The weekly New York price of menhaden oil started the year at 19.5 cents per pound and gradually reached a low of 16.5 cents at the end of September 1981--the lowest price since 1976. Since then, the price rose mildly to 18 cents by February-March 1982. The price of fish oil in Europe (at Hamburg) has shown wider variation. From a high of almost 22 cents per pound in December 1980, the Hamburg price fell below 17 cents in September 1981, a time when world trade is seasonally high and prices are usually low. The Hamburg price had risen to 18 cents by May 1982, but was still 6 percent below a year earlier.

OUTLOOK

U.S. production of fish oil should rise in 1982, assuming that the oil yield from menhaden returns to normal levels. Biologists estimates indicate that the menhaden catch itself should increase moderately. Because of the low stocks and small new supplies, U.S. exports of fish oil in January-March 1982 were only 9.2 million pounds.

World fish oil production in 1982 is expected to be slightly below 1981 levels, according to some forecasts. Among the major producers, Norway and Denmark will probably show a decline, while Peru (now a net importer) and the United States are expected to improve over last year. World exports and disappearance will be significantly lower, especially in light of the low stock levels and persisting tight supplies in early 1982. Growing demand for oil in edible products may shift more to other products as a result of this situation.

FIG. 5.--PRICES OF FISH OIL AND SOYBEAN OIL, MONTHLY, 1978-82



STATISTICAL APPENDIX

Table A 1.--Fish meal production, imports, exports, and chick placements, 1959-81 (1)

Year	Fish meal production (1)			Imports			Total production plus imports	Exports	Total net supplies	Chick placements
	Menhaden	Tuna and mackerel	Total (2)	From Peru	From Canada	Total (2)				
	Thousand short tons									Million
1959	223.9	25.4	296.8	49.9	39.0	132.9	429.7	(3)	(3)	1,632.7
1960	218.4	26.5	281.4	68.2	31.0	131.6	413.0	(3)	(3)	1,738.3
1961	247.6	21.2	300.5	151.4	38.2	217.8	518.3	(3)	(3)	1,916.5
1962	239.7	26.6	301.0	186.2	42.8	252.3	553.3	(3)	(3)	1,993.9
1963	182.4	27.0	248.0	285.4	51.0	376.3	624.3	(3)	(3)	2,054.4
1964	160.4	21.1	225.1	348.0	54.8	439.1	664.2	(3)	(3)	2,149.6
1965	176.0	25.4	242.3	209.8	43.8	270.7	513.0	(3)	(3)	2,368.8
1966	135.0	25.3	212.4	276.6	43.6	447.8	660.2	(3)	(3)	2,594.4
1967	119.1	25.5	201.4	442.5	46.6	651.5	852.9	(3)	(3)	2,594.8
1968	143.2	28.8	227.0	635.9	65.1	855.3	1,082.3	(3)	(3)	2,621.7
1969	159.5	26.9	244.1	218.1	67.8	358.4	602.5	(3)	(3)	2,847.1
1970	188.6	26.7	257.0	153.2	75.4	251.5	508.5	4.7	503.8	3,000.9
1971	221.0	29.3	282.9	199.6	57.6	283.2	566.1	10.1	556.0	2,982.2
1972	193.6	43.2	274.1	352.2	27.6	392.0	666.1	10.4	655.7	3,105.2
1973	188.8	43.6	279.1	41.8	24.6	68.5	347.6	36.7	310.9	3,038.3
1974	203.9	48.2	291.7	29.4	30.3	68.3	359.9	55.5	304.4	2,942.8
1975	191.4	37.2	279.2	75.5	34.0	118.4	397.5	11.8	385.8	3,009.0
1976	212.6	40.1	299.0	79.4	34.0	140.4	439.4	33.1	406.2	3,325.8
1977	193.3	39.2	273.0	15.6	24.8	81.5	354.5	36.1	318.4	3,475.4
1978	276.5	50.6	353.7	6.6	32.7	43.9	397.6	50.7	346.9	3,702.7
1979	280.8	47.4	363.3	28.2	27.2	89.6	452.9	15.7	437.2	4,004.8
1980	271.2	47.0	355.3	6.6	24.2	49.5	404.9	85.3	319.6	4,065.5
1981	230.8	47.2	310.1	-	24.3	59.4	369.7	47.0	322.5	4,142.8

(1) Excludes meal made from shellfish.
(2) Total includes amounts from other categories not detailed here.
(3) Not available.

Note: NMFS, Resource Statistics Division; Bureau of the Census.

TABLE A 2.--SUPPLIES OF FISH MEAL IN THE UNITED STATES, BY MONTH, 1976-80 AVERAGE, AND 1981-82

	PRODUCTION			IMPORTS			TOTAL NEW SUPPLIES			EXPORTS			TOTAL		
	1976-80 AVERAGE	1981	1982	1976-80 AVERAGE	1981	1982	1976-80 AVERAGE	1981	1982	1976-80 AVERAGE	1981	1982	1976-80 AVERAGE	1981	1982
	THOUSAND SHORT TONS														
JANUARY	6.6	7.6	4.8	6.1	5.4	1.1	12.6	13.1	5.8	0.9	2.3	0.4	11.7	10.8	5.4
FEBRUARY	4.7	5.4	4.6	3.2	0.7	2.4	7.9	6.0	7.0	1.5	0.6	1.0	6.4	5.5	6.0
MARCH	6.1	5.6	4.8	4.8	0.9	1.1	10.9	6.5	5.9	1.2	7.3	0.5	9.7	-0.8	5.4
1ST QTR	17.4	18.6	14.2	14.0	7.0	4.6	31.4	25.7	18.8	3.6	10.2	1.9	27.8	15.4	16.9
APRIL	17.0	17.3	15.9	5.9	2.5	7.5	22.9	19.8	23.3	1.9	1.5	1.0	21.0	18.2	22.3
MAY	34.1	37.3		10.1	3.5		44.2	40.8		3.7	5.0		40.5	35.8	
JUNE	56.4	42.1		10.7	6.8		67.0	48.8		4.7	9.9		62.4	38.9	
2ND QTR	107.5	96.6		26.6	12.7		134.1	109.3		10.3	16.4		123.8	92.9	
JULY	56.3	60.3		6.6	1.8		62.9	62.1		6.3	9.7		56.6	52.4	
AUGUST	55.2	44.3		8.8	5.8		64.0	50.0		6.7	1.3		57.3	48.7	
SEPTEMBER	42.0	40.2		8.3	4.1		50.4	44.3		6.3	7.3		44.1	37.0	
3RD QTR	153.5	144.7		23.8	11.7		177.2	156.4		19.3	18.4		157.9	138.1	
OCTOBER	26.4	21.9		6.9	8.2		33.3	30.1		5.7	0.4		27.6	29.7	
NOVEMBER	11.3	16.2		5.5	17.2		16.8	33.4		2.3	0.7		14.5	32.7	
DECEMBER	12.7	12.1		4.6	2.5		17.3	14.6		2.9	0.9		14.5	13.7	
4TH QTR	50.5	50.2		17.0	28.0		67.5	78.1		10.9	2.0		56.5	76.1	
TOTAL	328.9	310.1		81.4	59.4		410.3	369.6		44.2	47.0		366.1	322.5	

NOTE: PRODUCTION EXCLUDES MEAL FROM SHELLFISH. 1982 FIGURES ARE PRELIMINARY.
FIGURES MAY NOT ADD TO TOTAL BECAUSE OF ROUNDING.

SOURCE: NMFS, RESOURCE STATISTICS DIVISION; BUREAU OF THE CENSUS.

TABLE A 3.--U.S. PRODUCTION OF FISH MEAL BY SPECIES, BY MONTH, 1976-80 AVERAGE, AND 1981-82

MONTH	ANCHOVY			MENHADEN			TUNA AND MACKEREL			UNCLASSIFIED			TOTAL		
	1976-80 AVERAGE	1981	1982	1976-80 AVERAGE	1981	1982	1976-80 AVERAGE	1981	1982	1976-80 AVERAGE	1981	1982	1976-80 AVERAGE	1981	1982
	THOUSAND SHORT TONS														
JANUARY	0.7	2.1	(1)	2.0	0.8	0.0	3.0	3.7	3.5	0.9	1.1	1.3	6.6	7.6	4.8
FEBRUARY	0.3	(2)	0.0	0.0	0.0	0.0	3.1	3.9	3.6	1.3	1.5	1.0	4.7	5.4	4.6
MARCH	0.6	0.0	0.0	0.0	0.0	0.0	3.8	3.6	3.9	1.7	2.0	1.0	6.1	5.6	4.8
1ST QTR	1.7	2.1	(1)	2.0	0.8	0.0	9.9	11.2	11.0	3.9	4.6	3.2	17.4	18.6	14.2
APRIL	2.4	2.3	3.4	9.1	8.5	9.8	3.7	4.1	0.7	1.8	2.3	1.9	17.0	17.3	15.9
MAY	1.3	0.3		26.5	27.7		3.6	4.1		2.7	2.5		34.1	37.3	
JUNE	0.5	1.0		49.7	34.7		3.4	4.5		2.8	1.9		56.4	42.1	
2ND QTR	4.1	3.6		85.3	71.0		10.8	12.7		7.3	6.7		107.5	96.6	
JULY	0.0	0.0		49.5	53.8		3.9	4.5		2.8	2.0		56.3	60.3	
AUGUST	(3)	0.0		47.8	36.3		4.1	4.6		3.3	3.3		55.2	44.3	
SEPTEMBER	0.4	(4)		86.1	35.1		4.2	3.6		3.1	1.5		42.0	40.2	
3RD QTR	0.4	(4)		183.4	125.2		12.2	12.7		9.2	6.9		153.5	144.7	
OCTOBER	1.8	(4)		18.3	16.0		4.0	4.3		2.3	1.6		26.4	21.9	
NOVEMBER	2.1	1.1		4.0	10.3		4.0	3.6		1.3	1.1		11.3	16.2	
DECEMBER	2.1	0.7		5.6	7.6		4.0	2.8		1.0	1.0		12.7	12.1	
4TH QTR	6.0	1.9		27.9	33.9		12.0	10.7		4.6	3.7		50.5	50.2	
TOTAL	12.2	7.5		298.6	230.8		44.9	47.2		25.0	21.9		328.9	310.1	

(1) INCLUDED WITH APRIL.
(2) INCLUDED WITH JANUARY.
(3) INCLUDED WITH SEPTEMBER.
(4) INCLUDED WITH NOVEMBER.

NOTE: PRODUCTION EXCLUDES MEAL FROM SHELLFISH.
FIGURES MAY NOT ADD TO TOTAL BECAUSE OF ROUNDING. 1981 FIGURES ARE PRELIMINARY.

SOURCE: NMFS, RESOURCE STATISTICS DIVISION.

TABLE A 4.--U.S. IMPORTS OF FISH MEAL BY COUNTRY OF ORIGIN, BY MONTH, 1976-80 AVERAGE, AND 1981-82

MONTH	CANADA			PANAMA			PERU			CHILE			TOTAL (1)		
	1976-80 AVERAGE	1981	1982	1976-80 AVERAGE	1981	1982	1976-80 AVERAGE	1981	1982	1976-80 AVERAGE	1981	1982	1976-80 AVERAGE	1981	1982
	THOUSAND SHORT TONS														
JANUARY	1.2	1.0	0.9	1.4	0.0	0.0	2.3	0.0	0.0	0.0	4.4	0.0	6.1	5.4	1.1
FEBRUARY	1.3	0.7	1.1	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	3.2	0.7	2.4
MARCH	1.8	0.9	1.1	0.2	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	4.8	0.9	1.1
1ST QTR	4.3	2.6	3.1	1.6	0.0	0.0	5.1	0.0	0.0	0.0	4.4	0.0	14.0	7.0	4.6
APRIL	2.4	2.5	1.9	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	5.4	5.9	2.5	7.5
MAY	2.3	2.1		0.5	1.3		4.5	0.0		0.4	0.0		10.1	3.5	
JUNE	2.1	1.2		1.6	5.5		3.2	0.0		0.0	0.0		10.7	6.8	
2ND QTR	6.9	5.9		2.1	6.8		8.9	0.0		0.4	0.0		26.6	12.7	
JULY	3.3	1.8		1.0	0.0		1.3	0.0		0.0	0.0		6.6	1.8	
AUGUST	4.2	4.2		1.0	1.5		1.4	0.0		0.6	0.0		8.8	5.8	
SEPTEMBER	3.0	4.1		0.0	0.0		4.1	0.0		0.6	0.0		8.3	4.1	
3RD QTR	10.5	10.2		2.0	1.5		6.8	0.0		1.1	0.0		23.8	11.7	
OCTOBER	3.0	2.7		0.8	0.0		2.0	0.0		0.6	5.5		6.9	8.2	
NOVEMBER	2.3	1.1		0.0	0.0		3.2	0.0		0.0	16.1		5.5	17.2	
DECEMBER	1.5	1.8		0.5	0.0		1.3	0.0		0.0	0.8		4.6	2.5	
4TH QTR	6.9	5.6		1.4	0.0		6.5	0.0		0.6	22.4		17.0	28.0	
TOTAL	28.6	24.3		7.1	8.3		27.3	0.0		2.1	26.8		81.4	59.4	

(1) TOTAL INCLUDES AMOUNTS FROM OTHER COUNTRIES NOT DETAILED HERE.
(2) LESS THAN 50 SHORT TONS.

NOTE: FIGURES MAY NOT ADD TO TOTAL BECAUSE OF ROUNDING.

SOURCE: BUREAU OF THE CENSUS.

Table A 5.--U.S. fish meal exports, annual, by country of destination, 1973-81

Country of destination	1973	1974	1975	1976	1977	1978	1979	1980	1981
				Short tons					
Canada	2,685	2,163	3,050	1,817	2,076	525	904	1,011	1,783
Domincan Republic	396	690	1,309	412	-	1,160	1,007	1,656	1,604
Guatemala	160	-	-	-	-	-	-	-	-
Mexico	1,264	8,533	-	-	1,064	351	682	1,154	1,224
Belgium	865	-	-	-	-	-	5	700	775
Germany, West	21,886	33,006	3,066	17,217	22,832	29,803	951	49,002	18,466
Italy	-	275	-	-	-	113	-	8,272	-
Netherlands	189	-	-	-	-	-	-	-	-
Spain	488	466	-	-	-	-	-	-	-
United Kindgom	1,689	542	-	-	-	50	-	-	-
Yugoslavia	-	275	-	-	-	-	-	-	-
Iran	4,297	1,905	-	292	220	2,122	-	-	-
Lebanon	-	-	-	-	210	-	-	763	-
Saudi Arabia	-	-	-	-	154	1,297	512	228	-
Syria	-	-	-	-	-	-	-	-	-
Philippines	-	-	-	-	-		784	6,091	1,428
Taiwan	-	-	-	-	1,781	94	259	4,046	2,198
Egypt	928	6,063	3,274	11,530	6,120	13,903	9,720	9,878	18,659
Ghana	1,542	506	847	782	711	600	-	-	250
Libya	-	866	-	-	-	-	-	-	-
Zaire	181	-	-	-	-	-	-	-	-
Australia	17	-	-	-	-	279	154	-	-
Other countries	145	225	237	430	935	403	723	2,480	640
Total	36,732	55,515	11,783	33,141	36,103	50,700	15,701	85,281	47,027

TABLE A 6.--BROILER CHICKS PLACED IN 21 STATES. AND AVERAGE BROILER PRICE AT THE FARM, BY MONTH, 1976-80 AVERAGE, AND 1980-82

TIME PERIOD	CHICKS PLACED				PERCENTAGE CHANGE IN CHICKS PLACED			BROILER PRICE AT THE FARM		
	1976-80 AVERAGE	1980	1981	1982	IN 1980 FROM 1976-80 AVG.	IN 1981 FROM 1980	IN 1982 FROM 1981	1980	1981	1982
	MILLION				PERCENT			CENTS/LB		
JANUARY	304.6	345.8	345.5	350.7	13.5	-0.1	1.5	27.1	30.2	27.1
FEBRUARY	285.5	332.4	321.7	317.5	16.4	-3.2	-1.3	25.1	30.4	27.0
MARCH	327.7	366.2	372.5	367.3	11.7	1.7	-1.4	24.0	29.7	26.9
1ST QTR	917.8	1044.3	1039.7	1035.5	13.8	-0.4	-0.4	25.4	30.1	27.0
APRIL	325.8	353.1	362.7	276.5	8.4	2.7	-23.8	22.6	26.8	26.2
MAY	338.5	361.4	375.5	351.4	6.8	3.9	-6.4	24.1	28.2	28.0
JUNE	328.6	350.9	359.1		6.8	2.3		24.5	29.2	
2ND QTR	993.0	1065.4	1097.4		7.3	3.0		23.7	28.1	
JULY	321.0	345.1	353.3		7.5	2.4		32.0	30.4	
AUGUST	306.6	318.6	343.2		3.9	7.7		32.1	29.2	
SEPTEMBER	286.9	315.6	330.3		10.0	4.6		32.0	26.8	
3RD QTR	914.5	979.3	1026.9		7.1	4.9		32.0	28.8	
OCTOBER	293.4	328.6	321.7		12.0	-2.1		31.4	25.9	
NOVEMBER	285.6	311.9	312.4		9.2	0.2		30.2	25.2	
DECEMBER	310.5	336.0	344.8		8.2	2.6		29.7	24.6	
4TH QTR	889.5	976.5	978.9		9.8	0.2		30.4	25.2	
TOTAL	3714.7	4065.5	4142.8		9.4	1.9		27.9	28.1	

NOTE: FIGURES MAY NOT ADD TO TOTAL BECAUSE OF ROUNDING. 1981 AND 1982 FIGURES ARE PRELIMINARY.

SOURCES: DELMARVA BROILER CHICK REPORT, U.S. DEPARTMENT OF AGRICULTURE, STATISTICAL REPORTING SERVICE;
POULTRY AND EGG SITUATION, U.S. DEPARTMENT OF AGRICULTURE, ECONOMICS, STATISTICS, AND COOPERATIVES SERVICE.

Table A7.--Supply and use of fish meal in major exporting countries, January-December 1980 and 1981

Country and period	Beginning inventory	Production	Subtotal	Exports	Domestic consumption	Ending inventory
			Metric tons			
1980						
FEO countries (1)						
Chile	113,837	486,563	600,400	502,349	13,213	86,073
Iceland	13,389	169,170	182,559	156,713	10,842	15,004
Norway	92,067	292,490	384,557	269,333	47,412	67,812
Peru	73,300	444,650	517,950	415,497	57,866	44,587
South Africa	30,774	147,258	178,032	14,452	148,888	14,691
FEO total	323,367	1,540,131	1,863,498	1,358,344	278,221	228,167
Other countries						
Canada	3,257	47,766	51,023	30,367	18,638	2,341
Denmark	3,000	338,000	341,000	297,900	43,100	9,000
Grand total	329,624	1,925,897	2,255,521	1,686,611	339,959	239,508
1981						
FEO countries (1)						
Chile	86,073	566,447	652,520	439,043	6,856	206,681
Iceland	15,004	147,236	162,240	128,831	5,410	27,999
Norway	67,812	300,035	367,847	266,991	48,591	67,812
Peru	44,587	418,369	462,956	297,620	33,832	130,295
South Africa	14,691	150,824	165,515	4,956	149,334	11,618
FEO total	228,167	1,582,911	1,811,078	1,137,441	244,023	444,405
Other countries						
Canada	2,341	49,734	52,075	32,570	17,498	3,814
Denmark	9,000	302,000	311,000	270,700	41,900	8,000
Grand total	239,508	1,934,645	2,174,153	1,440,711	303,421	456,219

(1) Excluding Angola, for which country figures are not available.

Source: Fishmeal Exporters Organization (FEO), Paris; Oil World Weekly, published by ISTA Mielke & Co., Hamburg; Canada, Fisheries and Oceans, Ottawa; and other sources.

Note: Figures are preliminary, and may include slight discrepancies, owing to revisions, to differences in definition or reporting practices among sources and countries, and to other possible reasons. Figures for Denmark are partially estimated. Excludes Peruvian cannery meal.

Table A8.--FEO exports of fish meal by country of destination, January-December 1980 and 1981

Country of destination	Exports		Percentage of total FEO exports		Percentage change from 1980 to 1981
	1980	1981	1980	1981	
	Thousand metric tons		Percent		
France	36.0	33.6	2.7	3.0	- 6.7
Holland/Belgium	23.5	18.1	1.7	1.6	- 23.0
Italy	42.2	20.4	3.1	1.8	- 51.7
United Kingdom	61.6	64.2	4.5	5.6	+ 4.2
Germany, Fed. Rep.	389.5	399.2	28.7	35.1	+ 2.5
Scandinavian countries	156.7	132.1	11.5	11.6	- 15.7
Socialist countries	281.0	141.6	20.7	12.4	- 49.6
United States	10.0	21.1	0.7	1.9	+ 111.0
Cuba	65.5	42.7	4.8	3.8	- 34.8
Other Latin American countries	17.9	10.6	1.3	0.9	- 40.8
Iran	69.3	112.1	5.1	9.9	+ 61.8
China, P.R.	18.4	4.3	1.4	0.4	- 76.6
Japan	79.3	27.4	5.8	2.4	- 65.4
Taiwan	44.3	29.1	3.3	2.6	- 34.3
South Africa	-	22.4	-	2.0	-
Other countries	63.1	58.6	4.6	5.2	- 7.1
Total	1,358.3	1,137.4	100.0	100.0	- 16.3

Source: Fishmeal Exporters Organization (FEO).

TABLE A9.--SELECTED AVERAGE MONTHLY WHOLESALE PRICES AND PRICE RATIO OF FISH MEAL TO SOYBEAN MEAL, 1980-82

MONTH	MENHADEN (1)	TUNA-MIX (2)	IMPORTED PERUVIAN (3)	NORTHWEST EUROPE (4)	JAPAN (5)	SOYBEAN (6)		MENHADEN MEAL TO 50% PROTEIN SOYBEAN MEAL
						44% PROTEIN	50% PROTEIN	
	DOLLARS PER SHORT TON							PRICE RATIO
1980								
JANUARY	392.50	345.47	410.00	445.43	413.04	180.20	194.80	2.01
FEBRUARY	402.50	343.75	-	470.15	425.96	174.25	189.25	2.13
MARCH	399.00	343.75	-	433.87	447.84	164.63	180.38	2.21
APRIL	368.13	323.13	-	426.20	509.43	154.20	168.00	2.19
MAY	338.75	288.75	-	458.13	504.28	166.50	180.75	1.87
JUNE	325.00	288.75	-	439.08	520.41	160.88	175.13	1.86
JULY	358.75	308.35	-	434.73	501.66	187.90	202.10	1.78
AUGUST	371.25	314.19	-	444.30	510.79	207.38	222.13	1.67
SEPTEMBER	408.00	324.78	-	454.50	514.21	234.50	251.70	1.62
OCTOBER	452.50	346.50	-	464.30	-	246.38	262.63	1.72
NOVEMBER	496.88	385.00	-	515.29	497.05	261.38	277.13	1.79
DECEMBER	498.00	385.00	-	505.08	512.37	223.70	239.10	2.08
AVERAGE	400.94	333.12	410.00	457.59	487.00	196.82	211.92	1.89
1981								
JANUARY	466.25	385.00	-	490.79	567.82	223.50	240.00	1.94
FEBRUARY	419.38	357.50	-	470.15	531.16	212.50	229.00	1.83
MARCH	401.50	357.50	-	459.95	561.35	210.40	226.00	1.78
APRIL	408.13	357.50	-	454.32	649.36	222.00	238.50	1.71
MAY	420.63	354.41	-	457.00	674.65	221.00	237.50	1.77
JUNE	405.50	345.95	-	440.22	592.36	200.90	219.90	1.84
JULY	386.88	343.75	-	426.74	575.97	204.13	222.63	1.74
AUGUST	365.50	349.25	-	398.03	551.87	202.25	220.25	1.66
SEPTEMBER	380.00	350.63	-	393.27	496.43	190.00	207.00	1.84
OCTOBER	386.88	316.25	-	367.41	484.53	180.75	196.25	1.97
NOVEMBER	375.63	316.25	-	369.00	463.74	178.38	193.13	1.94
DECEMBER	364.50	316.25	-	362.20		187.50	202.10	1.80
AVERAGE	398.40	345.85		424.09		202.78	219.35	1.82
1982								
JANUARY	365.00	316.25	-	353.58		191.00	205.00	1.78
FEBRUARY	378.75	316.25	-	334.98		191.00	204.00	1.86
MARCH	382.50	325.88	-	323.87		183.60	197.60	1.94
APRIL	371.88	319.69	-	323.32		190.25	205.50	1.81
MAY	351.25	316.25	-	328.63		192.38	207.63	1.69
JUNE								
JULY								
AUGUST								
SEPTEMBER								
OCTOBER								
NOVEMBER								
DECEMBER								
AVERAGE								

(1) 60 PERCENT PROTEIN, BULK, QUOTED BY BROKERS AT NEW YORK CITY, F.O.B., EAST COAST AND GULF PLANTS.
(2) 55 PERCENT PROTEIN, BULK, LOS ANGELES.
(3) 65 PERCENT PROTEIN, BULK, F.O.B., EAST COAST AND GULF PORTS.
(4) 64-65 PERCENT PROTEIN, ANY ORIGIN, C & F, HAMBURG, FEDERAL REPUBLIC OF GERMANY.
(5) THE AVERAGE UNIT VALUE OF IMPORTS INTO JAPAN OF FISH MEAL AND FLOUR. C.I.F., EXCLUDING ANY DUTIES ON IMPORTS IN EXCESS OF QUOTAS, CONVERTED AT THE AVERAGE MONTHLY CURRENCY EXCHANGE RATE.
(6) BULK, DECATUR, ILL.

SOURCE: FOR PRICES OF FISH MEAL IN THE UNITED STATES: NMFS, RESOURCE STATISTICS DIVISION.
FOR NORTHWEST EUROPE PRICES: OIL WORLD, ISTA MIELKE & CO., HAMBURG, FEDERAL REPUBLIC OF GERMANY.
FOR SOYBEAN MEAL PRICES: FEED MARKET NEWS, U.S. DEPARTMENT OF AGRICULTURE, CONSUMER AND MARKETING SERVICE, GRAIN DIVISION.
FOR JAPANESE PRICES: JAPAN TARIFF ASSOCIATION, JAPAN EXPORTS AND IMPORTS; IMF, INTERNATIONAL FINANCIAL STATISTICS.

Table A10. —U.S. supplies of fish solubles, 1960-81

Year	Production			Imports	Total supplies
	Menhaden	Other	Total		
	Thousand short tons				
1960	65.8	33.1	98.9	3.2	102.1
1961	73.3	38.9	112.2	6.7	119.0
1962	85.2	39.4	124.6	6.3	130.9
1963	74.8	32.6	107.4	7.1	114.5
1964	68.7	24.6	93.3	4.5	97.8
1965	73.2	21.7	94.8	5.1	100.0
1966	60.8	22.7	83.4	4.3	87.7
1967	51.8	22.9	74.7	3.7	78.3
1968	53.2	18.6	71.8	1.8	73.6
1969	63.3	18.4	81.7	0.2	81.8
1970	71.9	23.1	95.0	0.5	95.4
1971	91.5	19.7	111.2	0.1	111.2
1972	104.1	30.3	134.4	0.1	134.5
1973	104.4	33.1	137.4	0.3	137.7
1974	102.9	34.3	137.3	-	137.3
1975	83.6	44.2	127.8	0.1	127.9
1976	95.3	37.8	133.1	1.2	134.3
1977	87.4	34.9	122.3	0.8	123.2
1978	132.0	30.5	162.5	(1)	162.5
1979	104.9	30.0	134.9	(1)	134.9
1980	99.4	34.3	133.7	(1)	133.7
1981	99.7	28.9	128.6	(1)	128.6

(1) Imports not reported separately beginning in 1978.
Note: Figures may not add to total because of rounding; 1981 figures subject to revision.

TABLE A11.--PRODUCTION AND AVERAGE PRICE OF FISH SOLUBLES, BY MONTH, 1976-80 AVERAGE AND 1981-82

MONTH	PRODUCTION				PRICE (1)			MENHADEN SOLUBLES TO MENHADEN MEAL		
	1976-80 AVERAGE	1980	1981	1982	1980	1981	1982	1980	1981	1982
	THOUSAND SHORT TONS				DOLLARS PER SHORT TON			PRICE RATIO		
JANUARY	2.2	2.7	3.4	2.8	110.00	117.50	117.50	0.28	0.25	0.32
FEBRUARY	1.5	1.4	1.8	3.5	107.50	121.25	117.50	0.27	0.29	1.51
MARCH	2.6	1.7	1.8	1.6	94.50	122.50	117.00	0.24	2.61	2.61
1ST QTR	6.4	5.7	6.9	7.8	104.00	120.42	117.33	0.26	0.28	0.31
APRIL	8.5	8.9	5.7	9.1	92.50	122.50	113.75	0.25	0.30	0.31
MAY	13.6	16.5	13.1		92.50	125.00	110.63	0.27	0.30	0.31
JUNE	21.0	18.7	18.7		89.50	125.00		0.28	0.31	
2ND QTR	44.2	44.1	37.5		91.50	124.17		0.27	0.30	
JULY	22.6	21.3	25.8		92.50	123.75		0.26	0.32	
AUGUST	23.7	22.4	19.7		92.50	120.00		0.25	0.33	
SEPTEMBER	18.9	17.8	15.6		96.50	121.25		0.24	0.32	
3RD QTR	65.3	61.4	61.0		93.83	121.67		0.25	0.32	
OCTOBER	11.8	12.0	9.6		97.50	120.00		0.22	0.31	
NOVEMBER	6.5	5.3	7.5		112.50	120.00		0.23	0.32	
DECEMBER	4.3	5.1	6.1		123.50	114.00		0.25	0.31	
4TH QTR	22.6	22.4	23.3		111.17	118.00		0.23	0.31	
TOTAL	137.3	133.7	128.6		100.13	121.06		0.25	0.30	

(1) MENHADEN SOLUBLES IN TANK CARS. PRICE QUOTED BY BROKERS AT NEW YORK CITY, F.O.B. EAST COAST PLANTS.
(2) NOMINAL PRICE.

NOTE: FIGURES MAY NOT SUM TO TOTAL BECAUSE OF ROUNDING. 1981 FIGURES SUBJECT TO REVISION.

SOURCE: NMFS, RESOURCE STATISTICS DIVISION.

Table A12.--Fish oil production, imports, exports, domestic use, and apparent stock change, 1950-81

Year	U.S. production (1)					Imports (2)	Total supplies (3)	Exports (4)	U.S. industrial utilization (2)	Net change in stocks
	Menhaden	Tuna and mackerel	Herring	Other	Total					
	Million pounds									
1950	76.6	6.6	24.8	52.7	160.7	15.1	175.9	76.0	(5)	(5)
1951	94.0	5.3	11.3	22.9	133.5	17.4	150.9	49.8	(5)	(5)
1952	96.7	5.6	8.1	8.2	118.6	15.6	134.2	44.0	(5)	(5)
1953	133.7	4.9	5.4	6.7	150.7	12.0	162.6	108.5	(5)	(5)
1954	139.8	4.4	5.7	12.3	162.2	13.0	175.2	141.6	(5)	(5)
1955	159.2	4.1	8.2	13.6	185.1	10.4	195.5	142.7	74.9	- 22.1
1956	168.2	5.3	13.7	10.1	197.3	10.7	207.9	140.9	81.3	- 14.2
1957	118.5	5.5	14.1	10.1	148.2	7.2	155.4	114.9	83.0	- 42.5
1958	128.0	4.7	13.2	15.7	161.6	4.9	166.6	94.0	67.5	+ 5.1
1959	154.7	4.5	15.0	9.0	183.2	6.8	189.9	144.5	58.6	- 13.2
1960	183.4	3.8	11.5	6.9	205.6	8.9	214.6	143.7	56.8	+ 14.1
1961	235.2	5.7	6.1	7.6	254.6	8.4	263.0	122.5	64.8	+ 75.7
1962	232.6	5.0	5.1	4.8	247.5	10.8	258.2	123.0	62.9	+ 72.3
1963	167.6	5.9	5.7	4.5	183.7	8.6	192.2	262.3	52.1	-122.2
1964	157.7	4.8	10.3	4.2	177.0	11.8	188.8	151.5	47.7	- 10.4
1965	175.2	4.8	8.5	4.3	192.8	6.0	198.7	103.8	44.5	+ 50.4
1966	144.2	4.1	7.9	6.5	162.7	12.7	175.3	77.3	38.8	+ 59.2
1967	101.4	5.2	5.7	7.6	119.9	7.0	126.9	76.8	35.8	+ 14.3
1968	152.0	4.5	9.5	5.7	171.7	5.9	177.6	65.1	30.0	+ 82.5
1969	149.2	4.2	3.5	11.1	168.0	4.2	172.2	196.1	34.1	- 58.0
1970	186.3	3.5	5.4	10.9	206.1	5.5	211.6	158.8	31.4	+ 21.4
1971	244.0	4.9	5.9	10.2	265.0	7.5	272.5	229.9	26.5	+ 16.1
1972	167.0	5.0	5.1	11.3	188.4	9.5	197.9	193.2	29.8	- 34.5
1973	200.5	7.4	1.7	15.0	224.6	6.7	231.4	247.8	26.5	- 42.9
1974	217.0	5.8	(6)	14.1	238.0	12.4	250.3	199.1	35.0	+ 16.2
1975	213.3	6.4	(6)	25.9	245.7	11.3	256.9	191.8	36.8	+ 28.3
1976	186.4	6.3	(6)	11.8	204.6	20.9	225.5	179.2	38.4	+ 7.8
1977	116.1	3.8	(6)	13.2	133.2	13.7	146.9	90.6	35.4	+ 20.8
1978	284.0	4.4	(6)	7.9	296.3	16.0	312.3	222.0	33.8	+ 56.5
1979	251.3	5.4	(6)	11.2	267.9	14.5	282.4	198.5	32.3	+ 53.4
1980	291.4	4.1	(6)	17.0	312.5	21.4	333.9	284.0	21.9	+ 27.9
1981	170.0	4.5	(6)	9.8	184.3	18.3	202.6	238.3	19.6	- 55.3

(1) Excludes whale and sperm oils.
(2) Excludes liver, whale, and sperm oils.
(3) Production plus imports.
(4) Does not include exports of foreign merchandise.
(5) Not available.
(6) Included with other.

Note: Figures may not add to total because of rounding.

TABLE A13.--U.S. PRODUCTION OF FISH OIL BY SPECIES, BY MONTH, 1976-80 AVERAGE, AND 1981-82

MONTH	ANCHOVY			MENHADEN			TUNA AND MACKEREL			UNCLASSIFIED			TOTAL		
	1976-80 AVERAGE	1981	1982	1976-80 AVERAGE	1981	1982	1976-80 AVERAGE	1981	1982	1976-80 AVERAGE	1981	1982	1976-80 AVERAGE	1981	1982
	MILLION POUNDS														
JANUARY	0.2	0.2	0.0	0.3	0.2	0.0	0.3	0.5	0.4	0.2	0.2	0.2	1.1	1.1	0.6
FEBRUARY	(2)	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.3	0.2	0.3	0.2	0.6	0.5	0.5
MARCH	(2)	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.3	0.3	0.2	0.3	0.7	0.3	0.5
1ST QTR	0.3	0.2	0.0	0.3	0.2	0.0	1.0	0.8	0.9	0.7	0.7	0.7	2.3	1.9	1.6
APRIL	0.1	0.6	0.1	8.5	5.5	13.6	0.4	0.3	0.2	0.3	0.3	0.3	9.4	6.7	14.2
MAY	0.2	(1)		26.1	17.9		0.4	0.3		0.5	0.3		27.3	18.4	
JUNE	0.1	(1)		47.1	21.1		0.4	0.4		1.2	1.5		48.7	23.1	
2ND QTR	0.4	(1)		81.8	44.5		1.2	1.0		2.0	2.1		85.3	48.3	
JULY	(4)	(1)		43.5	40.2		0.4	0.4		1.7	1.3		45.7	41.9	
AUGUST	0.0	0.0		45.9	30.5		0.5	0.7		1.5	2.9		47.9	34.0	
SEPTEMBER	0.4	(1)		34.1	34.8		0.5	0.5		1.4	0.5		36.4	35.9	
3RD QTR	0.4	(1)		123.5	105.5		1.4	1.6		4.7	4.6		130.0	111.8	
OCTOBER	0.9	(5)		17.8	15.8		0.5	0.4		0.9	0.3		20.1	16.5	
NOVEMBER	0.9	0.9		1.5	3.7		0.4	0.4		0.3	0.2		3.0	5.2	
DECEMBER	0.6	(5)		1.0	0.3		0.4	0.3		0.2	0.1		2.3	0.7	
4TH QTR	2.4	0.9		20.3	19.8		1.2	1.1		1.4	0.6		25.4	22.4	
TOTAL	3.5	1.1		225.9	170.0		4.8	4.5		8.8	8.1		243.1	184.3	

(1) INCLUDED WITH UNCLASSIFIED.
(2) LESS THAN 50,000 POUNDS.
(3) INCLUDED WITH APRIL.
(4) INCLUDED WITH SEPTEMBER.
(5) INCLUDED WITH NOVEMBER.

NOTE: FIGURES MAY NOT ADD TO TOTAL BECAUSE OF ROUNDING.
1982 FIGURES SUBJECT TO REVISION.

SOURCE: NMFS, RESOURCE STATISTICS DIVISION.

TABLE A14.--U.S. EXPORTS, DOMESTIC INDUSTRIAL USE, AND TOTAL DISAPPEARANCE OF FISH OIL, BY MONTH, 1976-80 AVERAGE, AND 1980-82

MONTH	EXPORTS (1)				DOMESTIC DISAPPEARANCE (2)				TOTAL DISAPPEARANCE			
	1976-80 AVERAGE	1980	1981	1982	1976-80 AVERAGE	1980	1981	1982	1976-80 AVERAGE	1980	1981	1982
	MILLION POUNDS											
JANUARY	8.6	29.9	2.9	13.7	2.7	2.3	1.5	1.0	11.4	32.2	4.4	14.7
FEBRUARY	7.5	24.5	24.7	12.7	2.4	2.4	1.6	1.5	9.9	26.9	26.4	14.2
MARCH	7.4	10.2	43.1	9.2	2.8	2.3	1.5	1.2	10.2	12.5	44.7	10.4
1ST QTR	23.5	64.6	70.7	35.6	8.0	6.9	4.7	3.7	31.5	71.5	75.4	39.3
APRIL	7.0	29.9	6.8	13.8	2.9	1.8	2.0	1.2	9.9	31.7	8.8	15.0
MAY	9.3	13.9	21.4		3.0	2.5	1.8		12.3	16.4	23.2	
JUNE	12.4	4.8	28.8		2.8	1.8	2.1		15.1	6.6	30.9	
2ND QTR	28.7	48.6	56.9		8.7	6.1	5.9		37.4	54.8	62.8	
JULY	35.1	55.1	28.3		2.5	1.2	2.2		37.6	56.3	30.5	
AUGUST	44.7	40.2	4.8		2.9	1.8	1.3		47.6	42.1	6.1	
SEPTEMBER	31.4	50.4	29.6		2.9	1.8	1.0		34.3	52.1	30.6	
3RD QTR	111.1	145.7	62.6		8.3	4.8	4.6		119.4	150.5	67.2	
OCTOBER	16.0	15.5	0.2		2.5	1.5	1.2		18.5	17.1	1.4	
NOVEMBER	7.2	2.3	10.0		2.7	1.2	1.4		9.9	3.5	11.5	
DECEMBER	8.4	7.2	37.8		2.2	1.4	2.2		10.6	8.6	40.0	
4TH QTR	31.5	25.0	48.0		7.5	4.1	4.8		39.0	29.2	52.9	
TOTAL	194.9	284.0	238.3		32.4	21.9	20.0		227.3	305.9	258.4	

(1) BEGINNING IN JANUARY 1978, MAY INCLUDE EXPORTS OF WHALE SPERM OIL.
(2) INCLUDING MARINE MAMMAL OIL OTHER THAN SPERM OIL AND SOME HYDROGENATED FAT (VEGETABLE AND ANIMAL) AND OTHER FATS AND OILS IN PROCESS.
(3) LESS THAN 50,000 POUNDS.

SOURCE: BUREAU OF THE CENSUS. CURRENT INDUSTRIAL REPORT, FATS AND OILS, PRODUCTION CONSUMPTION AND STOCKS. SERIES: M20K(76-82).

NOTE: FIGURES MAY NOT ADD TO TOTAL BECAUSE OF ROUNDING.

Table A15.--U.S. fish oil exports, annual, by country of destination, 1972-81

Country of destination	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
	Thousand pounds									
Canada	2,578	1,181	1,255	1,241	191	312	639	405	539	423
Mexico	124	195	309	198	269	284	303	471	1,202	496
Panama	68	-	-	-	-	-	4	3	-	-
Argentina	-	-	-	-	-	402	41	9	9	3
Colombia	-	10,667	8,846	-	26,598	5,576	18,302	21,438	4,118	65
Belgium/Luxemb.	2,250	1,212	-	4,797	11,305	1,102	5,584	17,717	24,441	17,714
Denmark	2,425	-	-	-	-	-	-	-	-	-
France	-	8	-	-	-	1,921	1,987	1,876	1,984	-
Germany, West	26,250	5,511	11,467	12,080	13,855	13,968	45,042	13,820	36,890	12,026
Italy	-	-	-	-	285	-	-	2	13	79
Netherlands	82,220	146,386	147,067	55,408	82,905	52,554	81,968	75,168	86,051	77,787
Norway	9,171	-	11,038	-	1,323	2,200	1,125	494	7	2,542
Sweden	61,558	37,980	13,889	41,577	2,212	3,272	8,745	11,745	9,619	15,734
United Kingdom	11	41,388	4,122	74,628	34,088	7,938	50,600	45,048	83,678	96,790
Japan	49	22	-	-	-	-	251	-	-	20
Lebanon	1,212	2,583	442	1,342	-	-	2	-	-	-
South Africa	4,590	-	-	-	5,176	-	-	-	(1)	2
Australia	535	583	561	-	664	696	7	882	-	101
Other countries (2)	157	77	125	572	364	408	7,410	9,420	35,183	14,525
Total	193,198	247,793	199,122	191,843	179,235	90,633	222,012	198,497	284,004	238,308

(1) Less than 500 pounds.
(2) Includes 27 million pounds exported to Peru in 1980, and 10.8 million pounds in 1981.
Note: Figures may not add to total because of rounding.
Source: Bureau of the Census.

TABLE A16.--SELECTED AVERAGE MONTHLY PRICES OF FISH AND SOYBEAN OILS, AND PRICE RATIO OF MENHADEN OIL TO SOYBEAN OIL, 1980-82

	ANCHOVY (1)	MENHADEN (2)	TUNA (3)	NORTHWEST EUROPE (4)	SOYBEAN (5)	MENHADEN OIL TO SOYBEAN OIL
	CENTS PER POUND					PRICE RATIO
1980						
JANUARY	(6)	18.75	12.00	20.55	23.60	0.79
FEBRUARY	(6)	19.69	12.00	22.23	23.40	0.84
MARCH	(6)	19.80	12.40	22.11	22.10	0.90
APRIL	(6)	18.75	12.13	20.77	20.30	0.92
MAY	(6)	18.75	12.00	20.19	20.80	0.90
JUNE	(6)	18.35	12.00	19.79	21.60	0.85
JULY	(6)	18.25	12.00	19.87	26.20	0.70
AUGUST	(6)	18.25	12.00	20.01	25.90	0.70
SEPTEMBER	(6)	18.15	11.85	19.33	26.10	0.70
OCTOBER	(6)	18.00	11.81	18.55	25.10	0.72
NOVEMBER	(6)	19.13	11.94	20.87	26.70	0.72
DECEMBER	(6)	19.45	12.13	21.55	23.70	0.82
AVERAGE		18.78	12.02	20.49	23.79	0.79
1981						
JANUARY	16.38	19.38	12.13	20.98	23.00	0.84
FEBRUARY	(6)	19.00	12.13	20.64	22.00	0.86
MARCH	(6)	18.80	12.02	19.28	23.10	0.81
APRIL	(6)	18.75	12.00	19.50	23.40	0.80
MAY	(6)	18.00	12.13	19.39	21.57	0.83
JUNE	(6)	18.15	12.50	19.05	21.30	0.85
JULY	(6)	18.25	12.50	18.64	22.80	0.80
AUGUST	(6)	18.20	12.50	17.18	20.80	0.88
SEPTEMBER	(6)	17.38	12.50	16.78	19.40	0.90
OCTOBER	(6)	17.25	12.44	17.28	19.70	0.88
NOVEMBER	(6)	18.00	12.38	18.20	19.90	0.90
DECEMBER	(6)	17.60	12.25	17.92	18.90	0.93
AVERAGE	16.38	18.23	12.29	18.74	21.32	0.85
1982						
JANUARY	(6)	17.50	12.25	17.07	18.40	0.95
FEBRUARY	(6)	18.00	12.25	17.33	18.20	0.99
MARCH	(6)	17.90	12.25	17.24	18.50	0.97
APRIL	(6)	17.50	12.25	18.23	19.70	0.89
MAY	(6)	-	12.25	18.31	20.60	0.00
JUNE						
JULY						
AUGUST						
SEPTEMBER						
OCTOBER						
NOVEMBER						
DECEMBER						
AVERAGE						

(1) CRUDE OIL, F.O.B. PLANTS, QUOTED AT LOS ANGELES.
(2) CRUDE OIL, TANK CARS, F.O.B. EAST COAST PLANTS, QUOTED AT NEW YORK CITY.
(3) CRUDE OIL, F.O.B. PLANTS, QUOTED AT LOS ANGELES.
(4) CRUDE OIL, ANY ORIGIN, C.I.F. NORTHWEST EUROPE, QUOTED AT HAMBURG.
(5) CRUDE OIL, TANK CARS, F.O.B., DECATUR, ILL.
(6) SUPPLIES EXHAUSTED, NO QUOTES.

SOURCE: FOR U.S. PRICES: NMFS, RESOURCE STATISTICS DIVISION.
FOR N.W. EUROPE PRICES: OIL WORLD, ISTA MIELKE & CO., HAMBURG, FEDERAL REPUBLIC OF GERMANY.
FOR SOYBEAN OIL PRICES: FATS AND OILS SITUATION, U.S. DEPARTMENT OF AGRICULTURE.

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